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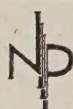
No. 312: High School Series, No. 6

THE RELATIVE STANDING
OF
PUPILS IN THE HIGH SCHOOL
AND
IN THE UNIVERSITY

By
WALTER FENNO DEARBORN
Assistant Professor of Education
The University of Wisconsin

MADISON
Published by the University
August, 1909

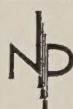
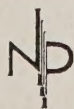




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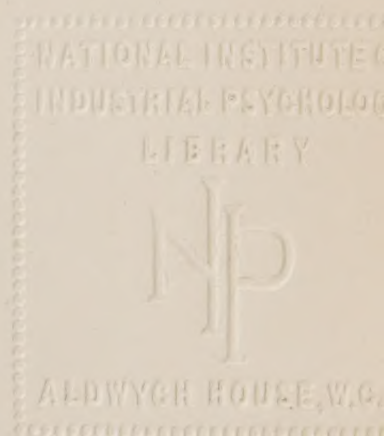
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By
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With an Introduction by
EDWARD C. ELLIOTT
Director of the Course for the Training of Teachers

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INTRODUCTION

The following investigation was started some two years ago at the suggestion of Dean E. A. Birge, of this University. The exigencies of other duties together with the extraordinary amount of labor involved in carrying out the original plan made it desirable to place the conduct and the determination of the scope of the study with Professor Walter F. Dearborn who was at the time engaged in a similar study of the relations of the elementary and high schools of the state. This explanation is offered in justice to Professor Dearborn who so willingly assumed the burden of the investigation after the work was only fairly under way.

Professor Dearborn has endeavored to investigate the character of the relationship of the success, as expressed by numerical gradings, of pupils in their work in the high school and that attained during the course of work in the University. The character of any such relationship would tend to throw light upon several problems vitally affecting the administrative and educational methods in both high schools and University. This is particularly true under the conditions of the development of American state educational systems, with their ladder-like progression of pupils from the lowest classes in the elementary school upward through the high school, to the college and professional school. The contemporary practice of these state systems is to admit pupils to the higher institutions on the basis of a certificate from secondary schools. The principle of the examination and the inspection of the general efficiency of *schools* rather than of *individual pupils* has been accepted. Such a certificate, in the majority of cases contains, in numerical terms, the grade attained by the pupil in the different high school subjects, which grade presumably corresponds to a definite standard of efficiency according to the rating of the school.

The main, though of course not the only question, then is, how closely do these standards of measurement of individual abilities correspond to the standards applied to the pupil after he becomes a student in the University, the organization and pedagogical method of which differ so widely from those of the lower school. Either a large or a small degree of correspond-

ence would signify much, both as regards the method and training of the high school and the method and training of the college. The quality of this correspondence which Professor Dearborn's study reveals should pave the way to a better understanding of some of our intricate educational relationships, which after all must be submitted to measurement before mere discussion pro or con of existing practices in high schools or colleges should be permitted to determine reconstructions and modifications. While the world may not value highly school "marks," the fact remains nevertheless that only a specious scepticism would deny that there was no correlation between secondary school success and college success. At any rate, in Wisconsin, there seems to be a demonstrable and positive relationship between the valuation of abilities of pupils while in high school and in University.

EDWARD C. ELLIOTT.

I. THE PROBLEM*

There has been much difference of opinion in regard to the relative merits of the college entrance examinations and the accredited school system as a basis for the admission of students to college. Most universities and colleges are now committed to the latter method. The reasons for its adoption have been various, but it has not been known with any definiteness whether or not it is as successful a means as the entrance examinations for determining the qualifications and the probable efficiency of pupils in college.

The investigation of Thorndike ⁽¹⁾ at Columbia University has shown very forcibly the inadequacy of the college entrance examinations, at least in Columbia College. The entrance examinations were not a successful means of determining what the relative attainments of pupils were likely to be subsequently. In some cases had the standards been the least bit higher, several of those who later became the highest ranking students in the college would have been excluded. And in a surprisingly large number of cases, those who did very poorly in the entrance examinations were found to have been later the best students in their college classes. "Of the students who were in the lower half of the group in the entrance examinations nearly forty per cent are found in the upper half in the last three years of college." ⁽¹⁾

The admission to college of students from the accredited schools is determined almost entirely by the school records or standings of the applicants, although there is an occasional admission made which is not based wholly on the previous record of the pupil. One purpose of this study is to inquire into the efficiency of this method of admission to college by determining to what extent and how accurately the high

* In the laborious work of tracing the high school and university records of the approximately five hundred students which form the basis of this study, the writer acknowledges with pleasure the assistance of the following students of the University: Messrs. Richard Schmidt, G. A. Gesell, and C. C. Tolg. The writer is further indebted for interest and advice during the progress of the work to Dean E. A. Birge, at whose suggestion the investigation was undertaken, and also to Professor Edward C. Elliott, Dr. Daniel Starch, and Dr. Frederick W. Roe, of the University, who have kindly read the manuscript or proofs of the article and suggested several changes of value. Considerable pains have been taken to eliminate errors in the presentation of the results, for such as may remain the writer is alone responsible.

⁽¹⁾ Science N. S., 23; 839.

school records forecast what pupils are likely to do in the way of scholarship in the college or university. The main problem investigated is somewhat more general than this and of wider interest, namely, to what extent students maintain in the university the *relative* rank which they held in the high school. That is, are the best and poorest students in the university those who stood respectively highest and lowest in their high school classes? Is the "average" student in the university class identical with the "average" high school pupil of a few years previous? Or is it true that these relations are to a considerable extent reversed, and that many of those who do poorly or only fairly well in the high school are quite as likely to lead their classes in the university as those whom the high school considered its better students. The investigation in Columbia College pointed to something of this latter condition, if we assume that the entrance examinations tested at all accurately the initial preparation and qualification of the pupils. At any rate we can not conclude that the results found at Columbia University were wholly the fault of the examination until we determine the possibility of a considerable change in standing on the part of students in the university.

In this study the grades secured by pupils in their work in the high school and in the university have been made the basis of comparison. With all the inequalities which exist in the use of marks or grades, they nevertheless indicate fairly well the *relative* attainments of pupils. Most inequalities in grading are due, not to differences in the judgment of teachers as to the relative abilities of pupils, but simply to the absolute marks given them. One teacher may mark all pupils low and another mark them high, and still not differ in the judgments thus made of the relative difference of the pupils in the class, that is, as to which pupils are the better or poorer students. There is, further, less difference of opinion if the scale of measurement is not too fine, that is, if it is not made a question of actual grades, but simply as to whether a pupil is a superior, an average, or an inferior student. Such a division of pupils will furnish a sufficiently accurate standard for the purposes of this study.

II. METHODS OF THE INVESTIGATION

The investigation has been confined to certain of the large high schools of the state of Wisconsin and to the College of Letters and Science of the University of Wisconsin, and the comparison has been made between the high school grades as given in the pupil's record submitted by the accredited school to the university on entrance, and the grade attained by the student in the university. When averages are compared, the average for the high school includes all the marks secured by the pupil during his high school course; in the case of the university marks, the average is confined to the marks secured in the year under comparison. This comparison is then between the average of the marks of several years in the high school and that of separate years in the university. When the ranks in separate subjects are compared, the high school mark is the average of all the marks in that particular subject, whereas in the university it is usually the mark secured in a single course. When, however, more than one course in a subject is taken by a pupil in the same year, the average of the marks received is taken as his rank just as in the case of the high school mark.

In tabulating the general averages, the ranks secured in such subjects as music, and physical training are not included. All other marks in the subjects taken by a student are added together and averaged.

The percentage system of marking is used in all the high schools studied, and the same system prevails in the university. The main difference,—but one which is not of importance to our study,—is that the dividing lines between the general grades of “good,” “fair,” “poor,” etc., are numerically somewhat different in the high schools and university. The following system prevails in the university: “Excellent” is denoted by the grades of 93 and above; “good” by 85 to 92, inclusive; “fair” by 78 to 84, inclusive, and “poor” by 70 to 77. There are two lower grades of “condition” and “failure” to which no numerical grade is attached.

All the students entering the university during the years 1900-1905, inclusive, from the high schools of the six cities in the state which sent the largest number of pupils to the university during that time have been included in this study. On

account of the great amount of work involved in tracing the record of each student, it was found necessary to limit the scope of the investigation to these schools. The results are typical of at least the larger high schools of the state, and probably without much modification of the smaller schools as well.

The schools studied are the Madison high school, three Milwaukee high schools, and four smaller high schools in the state. The names of the last schools are not given because the number of pupils from each is not large enough to justify individual comparison. The pupils from the Milwaukee schools are treated as a single group, no attempt being made to discriminate between the pupils from the different schools.

Comparisons have been made, first, on the basis of the *general numerical average* of the marks secured by a pupil in high school and the general average of his studies for each year in the university, and also of the marks received in certain subjects, as, for example, English, and the similar university grades.

The investigation has been made chiefly of the standings of the freshman and sophomore years of the university, but two groups of pupils have been followed throughout their four years at the university.

The following groups have been studied. The basis of comparison in the case of the first six is the general numerical average of the student's marks in all subjects. In the remaining groups the comparison is between the rank in a single subject, as, English, in high school, compared with that secured in the university:

(1) A group of 472 students, i. e., all those who entered from the eight high schools during the years 1900-1905, inclusive. The basis of comparison is the general average of the marks secured by each pupil in high school and in the first two years of the university. See Plate I, Charts A, B, and C; and Table I, Sections A, B, and C.

(2) A group of 180 students. Included in (1). These students are followed as a single group throughout the *four years* at the university. That is, only those are included in this group who completed the four years of study at the university and graduated in the years 1904-1907, inclusive. The

comparison is made between the standings in high school and the standings in each of the four years at the university. See Plate II, Charts A-E, and Table II, Sections A-E.

(3) A group of 238 students who entered from the Madison high school. The general averages are as in (1), the basis of comparison. The comparison is carried through the sophomore year at the university. See Plate III, Charts A, B, and C, and Table III, Sections A, B, and C.

(4) A group of 139 students who entered from the Milwaukee high schools. The general averages are the basis of comparison. The comparison is carried through the sophomore year at the university. See Plate III, Charts D, E, and F, and Table III, Sections D, E, and F.

(5) A group of 92 students from four cities. The general averages are the basis of comparison and it is carried through the sophomore year at the university. See Plate III, Charts H, I, and J; and Table III, Sections H, I, and J.

(6) A group of 115 students who entered from the Madison high school, during the years 1900-1904, inclusive, completed the four years at the university, and graduated in the years 1904-1907, inclusive. The comparison is made between the standings in high school and the standings in each of the four years at the university. See Plate V, Charts E-I, inclusive, and Table V, Section E-I.

In the remaining groups the comparisons are made between the relative ranks in the various school subjects, e. g., the standings of pupils in English in the high school are compared with their standings in English in freshman year at the university.

Correlation of Standing by Subjects

(7) Comparison of relative ranks in *English* in high schools and university. 255 students from eight high schools. See Plate IV, Charts A and B, and Table IV, Sections A-B.

(8) Comparison of ranks in *German*—189 students from eight high schools.

See Plate IV, Charts C and D, and Table IV, Sections C and D.

(9) Comparison of ranks in *Mathematics*—216 pupils from eight high schools.

See Plate IV, Charts E and F, and Table IV, Sections E and F.

(10) Comparison of ranks in *History*—219 pupils from eight high schools.

See Plate IV, Charts G and H, also Table IV, Sections G and H.

(11) Comparison of ranks in *Mathematics* secured by pupils in the Madison high school with their rank in *Mathematics* in freshman year in the university; 181 cases.

See Plate V, Charts A and B, also Table V, Sections A and B.

(12) Comparison of ranks in *English* secured by pupils in the Madison high school with their ranks in *English* in the freshman year in the university; 244 cases.

See Plate V, Charts C and D, also Table V, Sections C and D.

(13) Comparison of ranks (in other subjects) secured by pupils in the Madison high school with their rank (in the same subjects) secured in the freshman year in the university.

See Plate VI, Charts A-F, inclusive.

(14) Comparison of high school ranks (in the above and other subjects) in the case of classes from the other high schools with freshman ranks in the same subjects.

See Plate VI, Charts G-P, inclusive.

Each of the above mentioned groups has first been divided into four equal parts, on the basis of the grades assigned in the high school. The question asked then is, in general, are those pupils who were in the first or other quarters of this class in high school in the same quarters of this *same* group in the university. Except in the case of groups 1 and 2, and 7-11 inclusive comparisons are usually made only between the *same* group of individuals, and are thus more accurate and fair. If A has excelled B and C in his work in the high school, it is not a question whether he will excel other pupils who may enter the university from other high schools but simply whether A still excels B and C in the university work.

It was at first the intention to make such comparisons only between the pupils entering the university in a single year from a given high school, but the pupils entering from even the largest high school were not sufficient in numbers to make

a profitable comparison. On this account all the pupils entering from the same high school in several successive years have been put together in one group. Standards may vary somewhat from year to year in the same school with change of teachers, etc., but in the best and largest high schools the variation can not be large and certainly not of such extent as to affect materially a rough division of its pupils into the four general grades employed here.

It has also seemed desirable, in addition to studying the relations of the pupils of one high school to the university, to group together for a wider and more general comparison the pupils entering from several high schools. This has been done in Groups 1 and 2, and 7-11 inclusive. As the average of the marks of pupils entering from one high school was often one or two per cent higher or lower than that of another high school, it was the practice at first to weight the marks of all pupils to a common average of all the high schools included in the group. It was found, however, from actual trial that such weighting did not affect the general comparison sufficiently to make it worth while. In some cases, at least, the difference in averages of the high schools may represent real differences in the efficiency of the pupils concerned. But however that may be, the weighting of marks did not affect appreciably the large units of comparison employed in this study, and has not for that reason been made use of in the final results.

I. Freshman Year University of Wisconsin

			Green		Black		Eliminations	
Number of RED	% of RED	%	Purple		Green		Number of All Eliminations	%
			Number	%	Number	%		
Quartile I 76	64.4		21	17.8	16	13.5	9	9.7
" II 20	16.9		47	39.8	25	21.2	16	17.2
" III 17	14.4		31	26.3	37	31.4	21	22.6
" IV 5	4.2		19	16.1	40	33.9	47	50.5
Totals 118			118		118		93	100.

118 = 472

C. Sophomore Year University of Wisconsin

			Purple		Green		Black		Eliminations	
Number of RED	% of RED	%	Purple		Green		Black		Number of All Eliminations	%
			Number	%	Number	%	Number	%		
Quartile I 57	64.1		21	23.6	11	12.3	0	00.0	4	9.3
" II 26	29.2		36	40.5	16	18.0	11	12.3	7	16.3
" III 11	12.3		21	23.6	26	29.2	31	34.9	10	23.3
" IV 3	3.3		16	17.8	34	37.8	37	41.1	22	51.1
Totals 97			94		87		79 = 357		43	100.

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Chart A

High School Grades - (general averages) -

of 472 Pupils

from 8 High Schools

No. in	Quartile	I	II	III	IV
"	"	118	118	118	118
"	"	118	118	118	118
"	"	118	118	118	118
"	"	118	118	118	118

[illegible]

Chart B
Grades of Same ^{472 Pupils in}
Freshman Year

University of Wisconsin

No. in	Quartile	I =	II =	III =	IV =
" "	" "	118	118	118	118
" "	" "	118	118	118	118
" "	" "	118	118	118	118
" "	" "	118	118	118	118

[illegible]

Chart C
Grades of 357 of the above in

Sophomore Year
University of Wisconsin

No. 10	Quartile	I	89
" "	"	II	89
" "	"	III	89
" "	"	IV	90

Chart C

of 357 of the above in

Sophomore Year

City of Wisconsin

Article I = 89
Article II = 89
Article III = 89
Article IV = 90

427	241	289	350	314	405	183	350	233	179	164	493	492	303	318	435	144	319	328	250	316	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400	210	195	430	400
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III. EXPLANATION OF CHARTS ⁽¹⁾

In order to present these relations between the high school and the university in as simple a form as possible without employing elaborate statistical methods, the following very simple graphic scheme has been used. Each student whose marks or grades enter into this study has been assigned an individual number which he bears throughout. Beginning, then, with the averages of the marks attained in the high school or the grades in the specific studies as the case may be, the student's rank is indicated by placing his number above the proper grade in the horizontal scale of marks, as arranged in the accompanying charts. See Plate I. (The range of possible grades for those entering the university is from 70 to 100.) If a given student secured a grade 85, for example, his number is placed above that grade in the scale. The grades of all students are thus distributed and are then divided into four equal groups or QUARTILES. *Those numbers (representing the various students) which are in the first or highest quarter of the high school class are colored red; those standing in the second highest quarter of the class are colored purple; in the third quarter, green; and in the fourth quarter, black.* (See charts in Plate I.) *A red mark means therefore that the student designated thereby stood in the first quarter of the high school class or group in question, a purple mark that he ranked in the second highest quarter, etc.*

These quarters of the class will henceforth be designated the first (red), second (purple), third (green), and fourth (black), QUARTILES.

The colors thus assigned are retained throughout the comparison of a given group. Chart A in Plate I may be taken as an example. There are 472 cases, representing students entering the university from eight high schools. Each number, as stated, represents a certain individual and the column in which it is found represents the general average of all the marks secured by that pupil in his high school course. Nos. 288, 260 and 261, in the extreme right hand column, for example, secured a general average of 96 in all their high school

⁽¹⁾ Definitions of the following words or phrases which may not, in every case, be familiar to the general reader may be found on the following pages where each is first employed; quartile, page 15. median, page 17, footnote (2), percentages of retention, page 29, footnote (1).

work. This group of 472 is then divided into four equal parts, and the first quarter or the first 118 students are represented by red numbers; the second quarter of 118 are represented by purple numbers; the third, by green, and the last and in rank the lowest quarter of the group, by black.

The average of all the grades that each of these 472 pupils secured in the freshman year of the university has then been calculated for each individual, and the result is again presented in Chart B (Plate I) by placing each student's number in the proper grade. The colors of the numbers still indicate the quartile to which the student belonged in the high school group, so that it can now be easily determined whether or not any given individual, or to what extent individuals in general, maintained the same relative rank which they had in the high school. The first number, for instance, in grade 92 is 134, (bottom of column) and is colored green. The color indicates that this pupil although standing on entrance in the next to the lowest quarter of the high school group has during freshman year advanced nearly to the top of the class. Similarly No. 26, (black), in grade 89, is recognized as having been in the lowest quarter of the high school group. On the other hand, Nos. 281, 560 and 270, (red), at the top of the column of grade 80 were originally in the first quarter of the group on the basis of their high school marks. They have dropped in rank during freshman year to the lowest grade of the group.

It will be easily observed, however, that the instances just cited of considerable change in the relative rank in the two years compared are the exception rather than the rule, and that the majority have changed their relative rank very little. Most of those, for example, who were in the first quarter of the high school group, (color, red), are also in or near the first quarter of the group in the freshman year. The actual number and percentages of each color in the various quartiles are shown in the tables accompanying the charts. The tables for each plate will be found on the preceding page and are numbered to correspond to the various charts.

The reader may secure, however, from a mere glance at the charts a very good idea of the relation existing between the standing of pupils in the high school and the university classes. If pupils secured the same relative rank in the uni-

versity as in the high school there would be no changes in the color scheme, all red would remain in the first quartile, all purple in the second, etc. Or, if, on the other hand, there were an entire inversion of the relative standing of pupils, so that those who did well in the high school did poorly in the university, and vice versa, those who did poorly in the high school afterwards led their university classes, these facts would be shown, in that the colors would be entirely changed about, the red and purple numbers would be found in the lower grades and the green and black in the higher grades.

As a matter of fact, as the charts show, neither of these extreme cases occurs, but the first illustration is more nearly true than the second:—*pupils tend to maintain in the university the same relative rank which they held in the high school.* Just in how far this is true, a study of the following charts which are based on a sufficiently large number of cases to be typical, will indicate with a considerable degree of accuracy.⁽²⁾

⁽²⁾ A further detail of method may be mentioned. In the case of the general averages, the differences in the numerical marks have been taken account of to the tenth of one per cent in the high school groups, the numbers placed towards the top of each column having somewhat higher fractional percentages than those towards the bottom. With the single exception of the large distribution of 472, (Plate and Table I) the same method has been followed in the university distributions, in those columns, only, however, in which the division into quartiles falls. In this way the separation into the various quartiles, (divided by heavy lines in the charts), takes account of differences in the averages of one-tenth of one per cent. Since this was not done, as just stated, in the case of the group of 472, the dividing lines are so drawn as to include in the upper two quartiles as many as possible of the greens and blacks, i. e., of those who stood in the lower quartiles in the high school, and to include in the lower two quartiles as many of the reds and purples, as possible, i. e., of those who stood in the higher quartiles in the high school. The actual percentages of interchanges from quartile to quartile are undoubtedly somewhat less than this latter rough method of division appears to indicate. The general results disclose a very considerable, marked relationship between the high school and the university, and in this case the percentages of those retaining their position in the various quartiles would, if a finer scale had been used, be a few points higher.

The division into quartiles in the case of the university classes is made merely as a convenient aid in comparison, and not as an exact method.

A better way is often to take account merely of those who change from one-half of the class to the other half. This comparison is referred to in the following discussion in terms of those who fall or advance above the median of the class, the median point or grade being that above and below which fifty per cent of the class is found. In these distributions the median is the place of division between the second and third quartiles. It is usually in these groups equivalent to the average of the cases.

The squares about certain of the numbers in Charts B and C of Plate I and several of the charts in Plate III indicate that the individuals there represented dropped out of the university during the course of that year. The facts thus indicated will be discussed in the chapter on Elimination from the University.

IV. GENERAL RESULTS

The general results may best be presented in connection with the various charts which will be discussed in the order named above. The more general conclusions of the study are brought together in the last section.

Plate I, Charts A-C, and Table I, Sections A-C

Distributions of the grades (general averages) of 472 students, (A), in high school, (B), in freshman year university, (C), in sophomore year, (357 in group). Those left of this group in senior year are found in Plate II, Chart E.

Several general facts in regard to this group have already been mentioned in the last section in the explanation of the charts. As in the case of all charts, the general results may be gathered from an inspection of the distribution and more precisely in the tables of percentages, etc., which accompany them. Some more detailed comparisons may, however, be made.

As Table I shows, 76 out of 118, or 64 per cent of those who were in the first quartile in the high school remain in this same quartile in freshman year; 81 per cent of them remain in the first and second quartiles, only about a fifth therefore falling below the median of the class, and but four per cent falling into the lowest quartile. The percentages of students remaining in the other three quartiles in which they were in high school are less, namely, 40, 31, and 46 per cent for the second, third and fourth quartiles, respectively. As will appear also in later charts, there is less change in the composition of the first and last quartiles than in the case of the two middle quartiles.

Of these 472 pupils, only five who stood in the lowest quartile of the group on entrance, succeeded in reaching the rank of the first quartile, and they secured only the lowest grade in the quartile; similarly, but five of those who entered in the first quarter of this large group, dropped to the lowest quarter during the freshman year; and they stood in the highest grade of this quartile. These results seem remarkable when we contrast them with the notions, often current, of the extent of reversal which the freshman year of the university makes in the careers of high school students.

Table **II.** - Color Distribution (by Quartiles)
of 180 Pupils from 8 High Schools.
See Color Charts in Plate II.

High School									
A.		Quartile I 100% Red				Quartile III 100% Green			
		Quartile II 100% Purple				Quartile IV 100% Black			
Freshman Year University of Wisconsin									
B.		Red		Purple		Green		Black	
Quartile I	27	60%	13	28.9%	5	11.1%	0	00%	
Quartile II	10	22.2%	14	31.1%	13	28.9%	8	17.8%	
Quartile III	6	13.3%	12	26.7%	11	24.4%	16	35.6%	
Quartile IV	2	4.5%	6	13.3%	14	31.1%	23	51.1%	
Sophomore Year University of Wisconsin									
C.		Red		Purple		Green		Black	
Quartile I	27	60. %	14	31.1 %	4	8.9 %	0	.0%	
Quartile II	10	22.2%	14	31.1 %	14	31.1 %	7	15.5%	
Quartile III	7	15.5 %	12	26.7%	16	35.6%	10	22.2%	
Quartile IV	1	2.2%	5	11.1 %	11	24.4%	28	62.3%	
Junior Year University of Wisconsin									
D.		Red		Purple		Green		Black	
Quartile I	23	51.1%	16	35.5%	4	8.9%	2	4.5%	
Quartile II	13	28.9%	15	33.3%	12	26.7%	5	11.1%	
Quartile III	7	15.6%	8	17.8%	14	31.1 %	16	35.5%	
Quartile IV	2	4.5%	6	13.3%	15	33.3%	22	48.9%	
Senior Year University of Wisconsin									
E.		Red		Purple		Green		Black	
Quartile I	25	55.5%	14	31.1%	3	6.7%	3	6.7%	
Quartile II	12	26.7%	15	33.3%	11	24.5%	7	15.5 %	
Quartile III	5	11.2 %	10	22.2%	15	33.3%	15	33.3%	
Quartile IV	3	6.7%	6	13.3%	16	35.6%	20	44.4 %	

PLATE II

Chart A

High School Grades—(general averages)—
of 180 Pupils
from 8 High Schools

No. in Each Quartile = 45

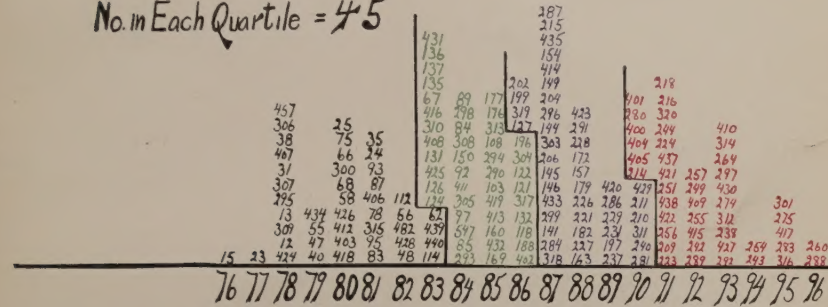


Chart C

Grades—(general averages)—
of the Same 180 Pupils
in Sophomore Year

University of Wisconsin

No. in Each Quartile = 45

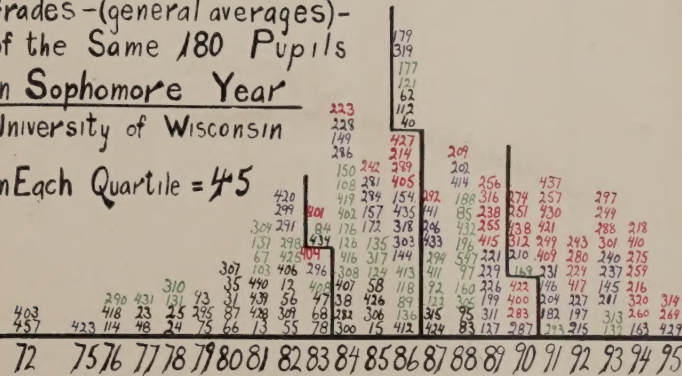


Chart E

Grades—(general averages)—
of the Same 180 Pupils

in Senior Year

University of Wisconsin

No. in Each Quartile = 45

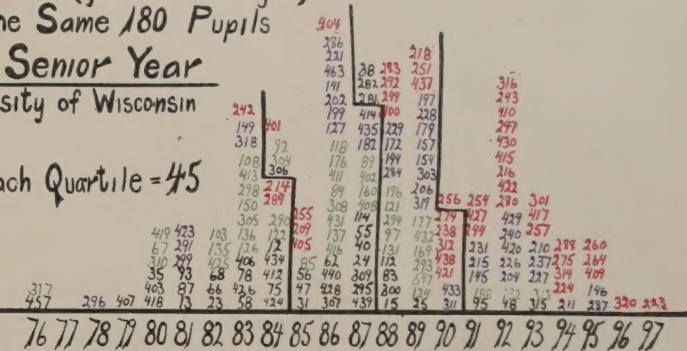


Chart B

High School Grades—(general averages)—
of 180 Pup
in Freshman Year

University of Wisconsin

No. in Each Quartile = 45

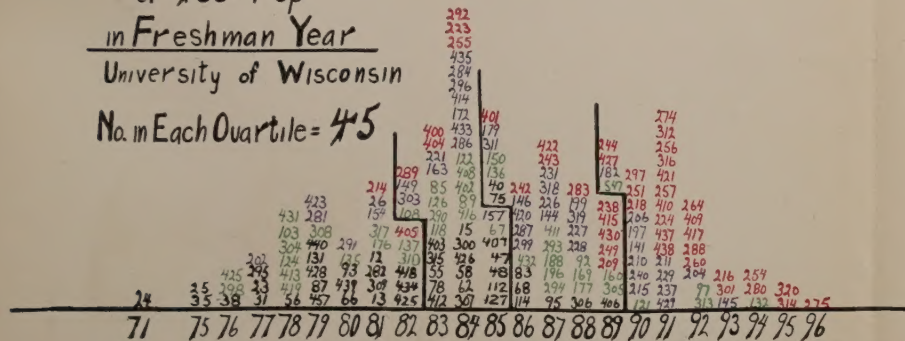
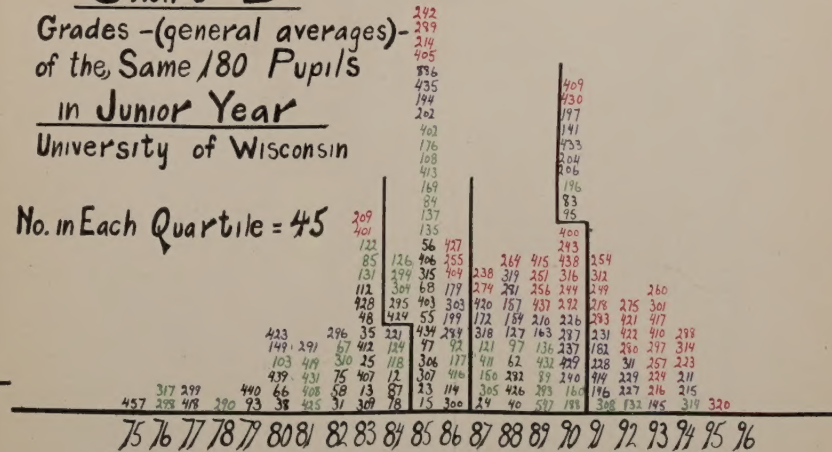


Chart D

Grades—(general averages)—
of the Same 180 Pupils
in Junior Year

University of Wisconsin

No. in Each Quartile = 45



We may say, then, on the basis of the results secured in this group, which is sufficiently large to be representative, that if a pupil has stood in the first quarter of a large class through high school, the chances are four out of five that he will not fall below the first half of his class in the university. ⁽¹⁾

And the opposite facts are nearly, if not quite as true; the chances are but about one in five that the student who has done poorly in high school work—who has been in the lowest quarter of his class—will rise above the median or average of the freshman class at the university, and the chances that he will prove a superior student at the university are very slim indeed.

The striking facts about this comparison are, first, the extent to which those who were in the first quarter of this group in high school maintain relatively the same position in the freshman year, and, secondly, the somewhat less marked tendency of the lowest quarter of the high school class to be limited to the last two quartiles of the freshman year. The interchange between the middle quartiles is, as remarked above much more extensive. ⁽²⁾

⁽¹⁾ It may be of interest to the reader versed in statistics to add that the Pearson coefficient of correlation of the standings in the high schools and in the freshman year of this group of 472 pupils is + 80 per cent.

⁽²⁾ One reason for the greater interchange between the middle quartiles and the relative permanence of the red quartiles is, in the first place, the very obvious one that a student ranking about the average of a class may either do better or poorer, i. e., move up or down in the distribution; whereas, of course, those in the first quartile can only be displaced in one way—downwards in the scale of rank, and, with the exception of possible elimination, this is similarly the case with the lowest quartile. There is, of course, then greater chance of an interchange towards the center of the group.

A further reason for this difference is, undoubtedly, because of the fact that the grades of fair and good are less carefully differentiated to begin with than are the grades of excellent and poor, or failure. There are nearly twice as many students found in the medium grades as in the higher or lower grades; to the relatively few in the extreme grades it seems likely that marks are assigned more discriminately than to the many in the medium grades, who because of their number, must really differ from each other by small amounts.

This seems a satisfactory explanation for the greater interchange of pupils between the second and third quartiles than is found between the first and second, or between the third and fourth.

This explanation is further consistent with the known facts in regard to the distribution of mental abilities; there are many more individuals possessing the medium range of abilities than there are of those who are either exceptionally well endowed or exceptionally deficient. Most individuals differ from each other and the average only by small amounts, few only differ greatly from the

What is true of the standing of students in the high school holds in just about the same proportions throughout the sophomore and junior years. About 93 students have dropped out of the freshman group before sophomore year. The facts in regard to the character of this elimination, will be discussed in a following section.

From an inspection of this first series of charts we are justified in drawing the general conclusions that *those students who are the best scholars in the high school are, usually, the best in the university, and similarly, that the poor scholars in the high school tend to remain so in the university.*

Plate II, Charts A to E and Table II, Sections A to E

This series of charts is, as the former, based on the general averages of the students entering from the eight high schools. It differs from the preceding in that it makes comparison from the start of those only who finished the four years at the university. In the case of the large group in Plate I the comparison in the sophomore year was on a somewhat different basis from that in the freshman year because of the elimination of students. This elimination is, of course, chiefly from the lower quartiles. In order to have a somewhat fairer or at least a different basis of comparison, this group is composed of those only who graduated from the university. The original assignment to quartiles and color is not influenced then by those who subsequently drop out of the comparison in the later years at the university. If a man ranks in the first quarter of this group on entrance and maintains his position in this quartile through his college course, he does so, so to speak, in competition throughout with the same group of men.

This group bears out the facts found in the case of the larger number. It is interesting to note that not until the junior year does a single one of the lowest quarter of the high school group reach the first quartile. In senior year there is a somewhat smaller percentage, (55), of the red numbers re-

common range of abilities. It is quite natural then that marks representing chiefly the teacher's estimate of the individual differences in ability of his pupils should be similarly distributed,—i. e., many ranked about the average, few at either extremes, either of excellence or deficiency. Since, as just stated, it is hard to discriminate between the small differences of the many, the greater interchange between these two quartiles results.

maining in the first quartile, but the change is not as extensive as appears,—in that there are as many “reds,” (82 per cent), in the first and second quartiles taken together as there were in the freshman year. Similar proportions hold of the other quartiles. *The high school alignment is held very consistently throughout the university.* A few details may be pointed out. The three individuals of the lowest high school quartile who were able in so far to better their standing that they reached the first quartile in senior year, do not, it is to be noticed, rise to the highest positions, but are found in the three lower grades of the quartile. The first quartile of the junior year has a smaller percentage (51) of “red” numbers than in any other of the four years. This indicates a greater shifting of the high ranking students than in other years. It is not extensive, however, as 80 per cent of them are found in the first two quartiles. The change may possibly be traced to the wider elective system of the junior year which undoubtedly admits of greater readjustment on the part of students. If this is the case, it is interesting to note that some of the “reds” regain their position in the senior year although the percentage of the original members of the quartile, (55), is still less than of the first two years, i. e., (60).

In concluding this survey of the general averages of students from the eight high schools, we may again note that the relative standing of pupils in high school is held to a rather remarkable extent throughout the university. Even in the senior year, in the group of 180 pupils, to cite a fresh example, 70 per cent of those who were either above or below the average or median of their class remain in these same positions. *Assuming that these results are typical of at least the larger high schools, seven out of every ten pupils from these high schools, who graduate from the university, and who secure in their general averages in the high school, the rank of about 86 per cent or above, will receive a similar grade in the university, and similarly, seven in every ten, who fall below this grade in high school, will fall below this grade in the university.*

III

Table III. - Color Distribution and Eliminations by Quartiles -
See Color Charts in Plate III.

Freshman Year - U. of W.

Pupils Entering From Madison High School

B.	Eliminations			
	#	%	#	%
Quartile I	36	61.0	16	27.1
Quartile II	15	25.4	18	30.5
Quartile III	7	11.7	14	23.3
Quartile IV	1	1.7	11	18.3
			17	28.3
			31	51.7
			21	42.9
			18	36.7
			10	20.4
			7	14.3
			9	18.2
			6	12.3
			10	20.4
			16	32.7
			21	42.9
			31	61.0
			42	84.0
			51	102.0
			61	122.0
			71	142.0
			81	162.0
			91	182.0
			101	202.0
			111	222.0
			121	242.0
			131	262.0
			141	282.0
			151	302.0
			161	322.0
			171	342.0
			181	362.0
			191	382.0
			201	402.0
			211	422.0
			221	442.0
			231	462.0
			241	482.0
			251	502.0
			261	522.0
			271	542.0
			281	562.0
			291	582.0
			301	602.0
			311	622.0
			321	642.0
			331	662.0
			341	682.0
			351	702.0
			361	722.0
			371	742.0
			381	762.0
			391	782.0
			401	802.0
			411	822.0
			421	842.0
			431	862.0
			441	882.0
			451	902.0
			461	922.0
			471	942.0
			481	962.0
			491	982.0
			501	1002.0

Pupils Entering From Milwaukee High Schools

E.	Eliminations			
	#	%	#	%
Quartile I	20	58.8	9	26.5
Quartile II	10	28.6	13	37.1
Quartile III	3	8.6	7	20.0
Quartile IV	2	5.7	5	14.3
			12	34.3
			16	45.7
			21	57.1
			25	69.0
			30	82.9
			35	97.1
			40	111.4
			45	125.7
			50	140.0
			55	154.3
			60	168.6
			65	182.9
			70	197.1
			75	211.4
			80	225.7
			85	240.0
			90	254.3
			95	268.6
			100	282.9
			105	297.1
			110	311.4
			115	325.7
			120	340.0
			125	354.3
			130	368.6
			135	382.9
			140	397.1
			145	411.4
			150	425.7
			155	440.0
			160	454.3
			165	468.6
			170	482.9
			175	497.1
			180	511.4
			185	525.7
			190	540.0
			195	554.3
			200	568.6
			205	582.9
			210	597.1
			215	611.4
			220	625.7
			225	640.0
			230	654.3
			235	668.6
			240	682.9
			245	697.1
			250	711.4
			255	725.7
			260	740.0
			265	754.3
			270	768.6
			275	782.9
			280	797.1
			285	811.4
			290	825.7
			295	840.0
			300	854.3
			305	868.6
			310	882.9
			315	897.1
			320	911.4
			325	925.7
			330	940.0
			335	954.3
			340	968.6
			345	982.9
			350	997.1
			355	1011.4
			360	1025.7
			365	1040.0
			370	1054.3
			375	1068.6
			380	1082.9
			385	1097.1
			390	1111.4
			395	1125.7
			400	1140.0
			405	1154.3
			410	1168.6
			415	1182.9
			420	1197.1
			425	1211.4
			430	1225.7
			435	1240.0
			440	1254.3
			445	1268.6
			450	1282.9
			455	1297.1
			460	1311.4
			465	1325.7
			470	1340.0
			475	1354.3
			480	1368.6
			485	1382.9
			490	1397.1
			495	1411.4
			500	1425.7

Pupils Entering From Four High Schools

H.	Eliminations			
	#	%	#	%
Quartile I	13	56.5	5	21.7
Quartile II	3	13.1	4	17.4
Quartile III	7	30.4	8	34.8
Quartile IV	0	0.0	6	26.1
			10	43.3
			14	58.3
			18	73.3
			22	88.3
			26	103.3
			30	118.3
			34	133.3
			38	148.3
			42	163.3
			46	178.3
			50	193.3
			54	208.3
			58	223.3
			62	238.3
			66	253.3
			70	268.3
			74	283.3
			78	298.3
			82	313.3
			86	328.3
			90	343.3
			94	358.3
			98	373.3
			102	388.3
			106	403.3
			110	418.3
			114	433.3
			118	448.3
			122	463.3
			126	478.3
			130	493.3
			134	508.3
			138	523.3
			142	538.3
			146	553.3
			150	568.3
			154	583.3
			158	598.3
			162	613.3
			166	628.3
			170	643.3
			174	658.3
			178	673.3
			182	688.3
			186	703.3
			190	718.3
			194	733.3
			198	748.3
			202	763.3
			206	778.3
			210	793.3
			214	808.3
			218	823.3
			222	838.3
			226	853.3
			230	868.3
			234	883.3
			238	898.3
			242	913.3
			246	928.3
			250	943.3
			254	958.3
			258	973.3
			262	988.3
			266	1003.3
			270	1018.3
			274	1033.3
			278	1048.3
			282	1063.3
			286	1078.3
			290	1093.3
			294	1108.3
			298	1123.3
			302	1138.3
			306	1153.3
			310	1168.3
			314	1183.3
			318	1198.3
			322	1213.3
			326	1228.3
			330	1243.3
			334	1258.3
			338	1273.3
			342	1288.3
			346	1303.3
			350	1318.3
			354	1333.3
			358	1348.3
			362	1363.3
			366	1378.3
			370	1393.3
			374	1408.3
			378	1423.3
			382	1438.3
			386	1453.3
			390	1468.3
			394	1483.3
			398	1498.3
			402	1513.3
			406	1528.3
			410	1543.3
			414	1558.3
			418	1573.3
			422	1588.3
			426	1603.3
			430	1618.3
			434	1633.3
			438	1648.3
			442	1663.3
			446	1678.3
			450	1693.3
			454	1708.3
			458	1723.3
			462	1738.3
			466	1753.3
			470	1768.3
			474	1783.3
			478	1798.3
			482	1813.3
			486	1828.3
			490	1843.3
			494	1858.3
			498	1873.3
			502	1888.3

Sophomore Year - U. of W.

Pupils Entering From Madison High School

C.	Eliminations			
	#	%	#	%
Quartile I	31	65.9	13	27.7
Quartile II	11	23.4	18	38.3
Quartile III	6	12.8	15	31.9
Quartile IV	2	4.3	6	12.8
			17	36.1
			22	46.8
			27	57.1
			32	67.4
			37	77.7
			42	88.0
			47	98.3
			52	108.6
			57	118.9
			62	129.2
			67	139.5
			72	149.8
			77	160.1
			82	170.4
			87	180.7
			92	191.0
			97	201.3

Chart A
High School Grades
of 238 Pupils
from Madison
High School

Q't'le I = 59
" II = 59
" III = 59
" IV = 61

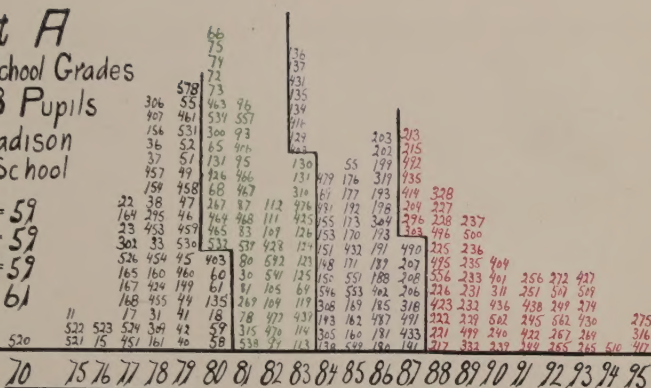


PLATE III

Chart B
Grades of Same 238 Pupils
in Freshman Year

Q't'le I = 59
" II = 59
" III = 60
" IV = 60

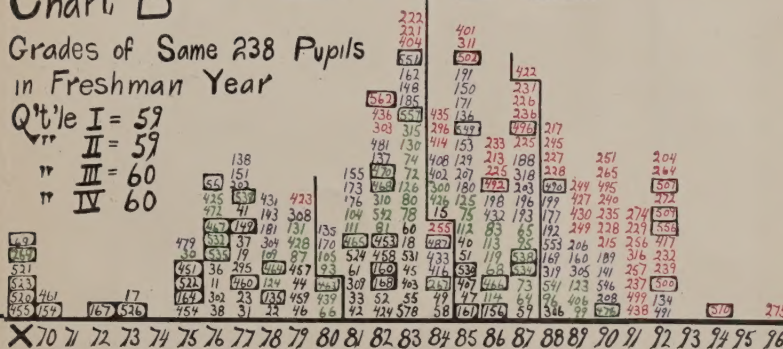


Chart C

Grades of 188 of the Same 238
Pupils in Sophomore Year

Q't'le I = 47
" II = 47
" III = 47
" IV = 47

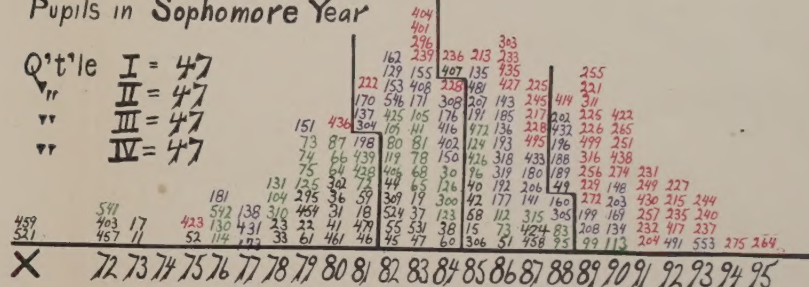


Chart D

High School Grades of 139 Pupils from
Milwaukee High Schools

Q't'le I = 35
" II = 34
" III = 35
" IV = 35

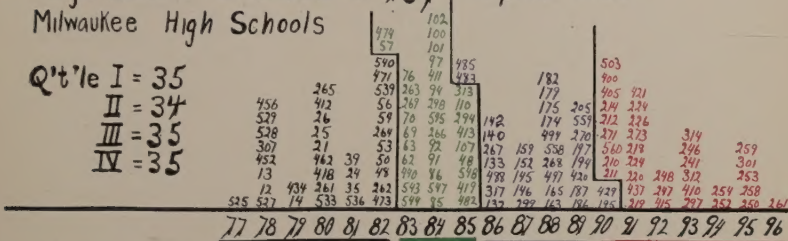


Chart E

Grades of the Same 139 Pupils in Freshman Year

Q't'le I = 34
" II = 35
" III = 35
" IV = 35

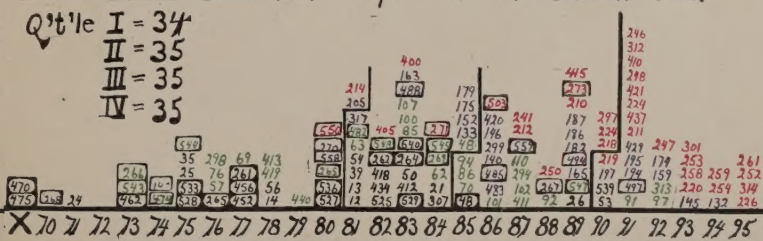


Chart F

Grades of 99 of Same 137 Pupils in
Sophomore Year

Q't'le I = 24
" II = 25
" III = 25
" IV = 25

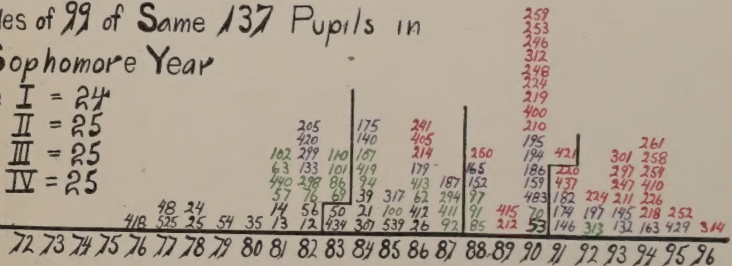


Chart G

High School Grades of 92 Pupils
from 4 Smaller High Schools

No. in Each Q't'le = 23

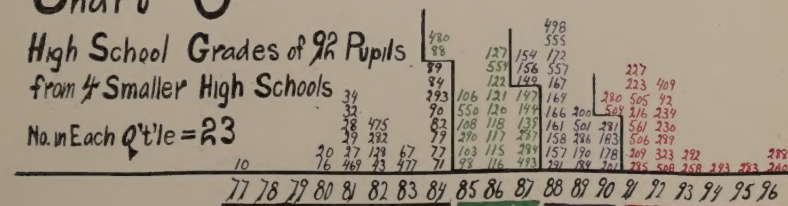


Chart H

Grades of Same 92 Pupils in
Freshman Year

No. in Each Q't'le = 23

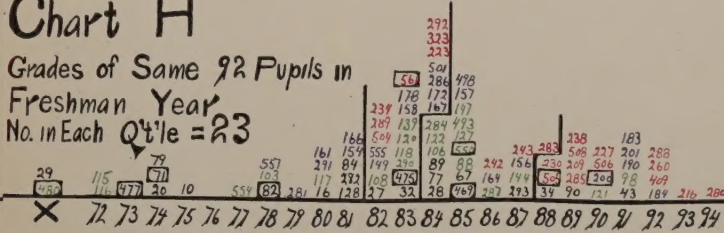
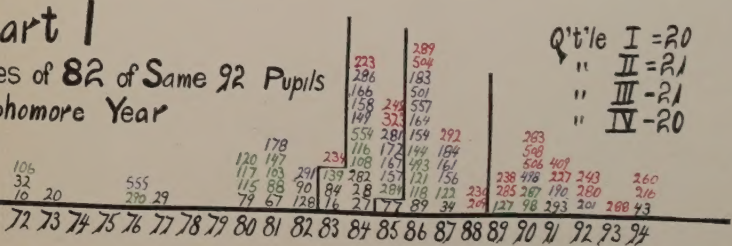


Chart I

Grades of 82 of Same 92 Pupils
in Sophomore Year

Q't'le I = 20
" II = 21
" III = 21
" IV = 20



V. CORRELATION OF INDIVIDUAL HIGH SCHOOLS AND THE UNIVERSITY

Comparison of Relative Standings in Separate High Schools with Standings in the University

The comparisons in the first two series of charts have been made of a group of students entering from several different high schools. It has seemed desirable also to study the correlation of the single high schools with the university. This has been done in the case of the Madison high school. (Plate III, Charts A, B, and C, and Plate V, Charts E-I, inclusive.) In the case of Milwaukee the pupils entering from all the high schools have been grouped together and the comparison has been made on the basis of this group and not on the basis of the separate high schools. Similarly the pupils from the four smaller high schools have been compared as a separate group.

The same general plan has been followed as in the previous charts. As large a group as possible has been followed through the first two years at the university (Plate III); then in the case of the Madison high school, a smaller group from that school, all of whom completed the four years and graduated from the university, has been studied separately. (Plate V, Charts E-I.) The other groups just enumerated have been carried through the sophomore year only.

Section 1. Comparison of the Standings of Pupils in the Madison High School with their subsequent standings in the University of Wisconsin. Made on the basis of the general averages of 238 pupils. (See Plate III, Charts A-C, and corresponding tables.)

There is a distinct advantage in confining the comparison to a group from a single high school. Pupils have passed through similar high school courses; have been graded for the most part by the same teachers, and are not brought into competition, so to speak, in the comparison, with pupils from other high schools. The question, therefore, resolves itself into a very simple form,—in how far is the estimate of the high school as indicated in the ranks of its pupils concurred in by the university? The average grades assigned these pupils are actually a little bit higher, about one per cent, than in the high

school. We are not, however, concerned with that fact, but, as has been stated, simply with the relative rank assigned to the various pupils,—i. e., does the university consider or find the same persons superior or inferior, etc., as did the high school.

An examination of the Charts A-C in Plate III and the accompanying tables shows that if anything this comparison indicates a little more strict alignment or retention of the same pupils in the quartiles or near to the quartiles in which they were first grouped. Eighty-six per cent of the first high school quartile, (reds), are found above the median of the freshman class, and 89 per cent or practically nine in every ten are above the median of the sophomore class. Similarly, the composition of the fourth, or lowest quartile, remains relatively intact,—85 per cent are found below the median in freshman year and 70 per cent in sophomore year.

These facts in regard to the relations of a single high school and the university thus confirm the deduction made from the larger group from several high schools and indicate that they are representative.

Some detailed comparisons of the records of the various high schools are made below and in the following sections:

Of the 59 pupils who during the years under consideration entered the university, with the grade of about 88 or above and thus formed the first quarter in standing of the group, but one is found in the lowest quarter of the group in the freshman year. This student, number 423, fell from a general average of 88 in high school, to 79. But seven of these first "quartiles" of the high school are in the third quartile of freshman year. To counterbalance this, there is but one student, number 306, who was in the lowest quartile on entrance who found place in the first quartile. His general average changed from 78 to 88. Similarly but nine of the lowest quartile are found in the second highest quartile of freshman year.

The displacement of those who form the second highest quarter of this group is more general than that of the first quarter; but even so, only about one-sixth of them (11 out of 59), are found in the lowest quarter of the group, and 14 in the second lowest. Sixteen of these, on the other hand, are found

in the first quartile of the freshman group, counterbalancing the 15 of the first high school quartile who are found in the second freshman quartile.

These relations are not very much different from the sophomore year, as may be seen from the tables accompanying the charts. Fifty students have dropped out, mainly from the lower part of the group. Of those who remain, 66 per cent or about two-thirds of the first quartile, (high school), remain in this quartile. The chances are thus about 2 to 1 that even through sophomore year those who were among the twenty-five per cent of superior students in the high school, will continue in this relation. Seventy-three out of a possible 94 remain in the first half of the group as they entered.

From the opposite point of view the results are just as impressive. Even up to, and including sophomore year, only 2.4 per cent of those who were poor students in the lowest quarter of the class have thus in two years' work in the university reached the rank of superior students, i. e., have reached the first quarter of this group.

Other equally significant comparisons may easily be made from the tables which accompany each chart.

The comparison of Plate V, Charts E to I, and Table V, Sections E to I confirms the results shown in Plate III in regard to the relation of this high school and the university and carries the comparison through the four years at the university. The comparison in this case is made from the start between the 115 pupils of this high school who during the years under consideration, graduated from the university. The results by the two methods differ little, the percentages of the larger group in Plate III and Table III being somewhat larger, due to the influence during the first two years of those who are then eliminated. The percentages of those in the first two quartiles on entrance who remain in the same quartile in freshman year are 72 per cent in Plate III, Chart B, and 70 per cent in Plate V, Chart B. Similarly, the results by the two methods, in the sophomore year, show that 77 per cent (Plate III), or 76 per cent (Plate V) of those above the median of the class on entrance, retain this rank.

This series permits us to carry the comparison through the junior and senior years. As appeared in the case of the larger

group of 180, (Plate and Table II) there is a somewhat greater disturbance of relative ranks in the first quartile in junior year than in the other three years. A disturbance which is again largely righted by senior year. This is largely, however, apparently due to the arbitrary method of division employed and to the fact that in junior year such a large number for some reason secure the rank of 90. Whereas, but 46 per cent of the first quartile remains intact as compared with 68 per cent in freshman year and 72 per cent in sophomore year, the change is, as in the case of the group of 180, not important as appears in the fact that 88 per cent of the *reds* are found in the first two quartiles which is a larger percentage than in any of the other years. The percentage of *blacks* remaining in the fourth quartile is exactly the same in the first three years, (41 per cent).

Following out the method of comparison instituted for the freshman and sophomore years, 72 per cent in junior year, and 66 per cent in senior year of those who, on entrance, stood in the first and second quartiles remain in them during these years.

On the basis of these figures, we may conclude in regard to this high school, as in the case of the larger group, that seven in every ten of the members of this high school who graduated from the university and who in high school stood in the upper half of their class, maintained the same rank throughout the university, which means in the case of this high school that they were in the first half of the entire class throughout the university.

A few details about this chart may further be noted. Only one individual, number 315, of the fourth entrance quartile, (black), is found in the first quartile of senior year, and in freshman and junior years also but one of the *blacks* is included in the first quartile. It is interesting to follow the course of those who ranked highest or lowest in high school: number 275, for example, maintains about the same rank throughout, viz., 95 high school average, 96 freshman year, 94 sophomore year, 92 junior and 94 senior year. The lowest in the entrance group, number 15, takes a higher rank in the university; 76 entrance, 84 freshman, 85 sophomore, 85 junior,

88 senior year. The fated number 23, does not advance as rapidly, the ranks being 77, 77, 78, 85, 82.

Section 2. Comparison of the Standings of Pupils in the Milwaukee High Schools with their subsequent standings in the University of Wisconsin. (See Plate III, Charts D-F and corresponding Tables.)

These charts are based on the general averages of all the students entering the university from Milwaukee high schools during the years under consideration. They show but little difference from the general averages of the group of 472 (Chart I). The correlation of standings is not quite as close as in the case of the Madison high school just considered. This may be easily seen by comparing the "percentages of retention" in the various quartiles. (See following Table). In the fourth quartile of freshman year there are but two per cent of "*reds*" in the case of the Madison high school and six per cent in the case of the Milwaukee high schools, and 52 per cent as against 46 per cent of the "*blacks*" remaining in their respective quartiles. Such comparisons show that the correlation with the university in the case of the Madison high school is somewhat closer, but the difference is not sufficiently large to be important and may be due to the fact that in the case of Milwaukee, pupils enter from three different high schools.

Percentages of Retention⁽¹⁾ in Each Quartile:

- (a) = Madison high school.
- (b) = Milwaukee high schools.
- (c) = Four high schools, different cities.

FRESHMAN YEAR

	1st q.	2nd q.	3rd q.	4th q.
	%	%	%	%
(a)	61	30	32	52
(b)	59	37	29	46
(c)	56	17	22	48

⁽¹⁾ By "percentages of retention" is meant the percentage who remain (or are retained) in each quartile of those who originally belonged in those quartiles on basis of high school grading.

SOPHOMORE YEAR

	1st q.	2nd q.	3rd q.	4th q.
	%	%	%	%
(a)	66	38	32	47
(b)	62	28	36	44
(c)	60	38	24	40

Section 3. Comparison of the Standings of Pupils in Four Smaller High Schools with their subsequent standings in the University of Wisconsin. (See Plate III, Charts G H I, Series VI Charts A-C.)

This group is composed of ninety-two pupils entering from four different high schools in about equal numbers from each. The group is thus too small for any important comparison. As may be seen in the above table, the "percentages of retention" in each quartile are less than in the other two cases. As far as these results indicate, there is, therefore, still less close correlation between the standards prevailing in these high schools and those of the university.

A comparison of the general form of distribution of the grades in these four high school systems also throws light on the relations to the university. The frequencies of marks in the various grades is about the same in school (a) as in the university, in *both* freshman and sophomore years, except that the general average of the university is a point or so higher than the high school. Neither is there much difference in the case of the schools of city (b), except for the relatively large number in *both* freshman and sophomore years who receive the high grades about 90. The case is very different as regards the pupils from the four smaller high schools. The group on the basis of high school standings appears to be a homogeneous group since it is distributed in about the same relative frequencies in the various grades as are the pupils entering from the other high schools. The average or median of these high schools is, to be sure, about three points higher than the ranks they secure in the university, but this is probably a relative and arbitrary difference, and the important fact is, that the grades of the pupils are grouped as symmetrically about their own median as were those of the other schools. In the university there is, however, a marked change. Not only is the

average of the group *three points lower*, but there is a marked shortage of pupils in the higher grades. That this is accidental is unlikely because the same thing holds true of the sophomore year.

While, then, the number of cases in this group is not sufficient to be conclusive, three lines of evidence are consistent in indicating that the pupils from these four smaller high schools are not quite as successful in meeting university requirements as are those from the larger high schools.

These points of evidence may be summarized. In the first place, it may be remarked that the group, as a group, appears to be homogeneous in that it is distributed about its median in the same relative frequencies as are the groups from the other high schools, or as the large group of 472. It approximates, in fact, a "normal" distribution. First, then, its pupils do not maintain their relative rank in the university as successfully as do those from the other high schools, although the difference is not great; secondly, the average of the group is three points higher than the average in the freshman and sophomore years in the university. This, as noted, may be a merely arbitrary difference. There is no reason why the high school average should not be higher, or lower, as far as that is concerned, provided only that all pupils are correctly graded relatively to each other. Such a difference does not, of course, affect the above comparison except in so far as the averages of the various high schools vary. The fact, however, gains some significance when it is noted that, in spite of their high entrance rank, they average as a group several points *below* the general freshman average. In the third place, this group, although distributed "normally" in the high school gradings, now shows a very different arrangement in the frequencies of each grade, in that most of the pupils are in the lower grades and relatively few in the higher. The fact that this change in the distribution persists for two years indicates that it is probably significant.

Table IV-Color Distributions by Quartiles

Pupils From 8 High Schools See Color Charts in Plate IV.

All High School Distributions

Quartile I 100% Red Quartile III 100% Green
Quartile II 100% Purple Quartile IV 100% Black

English—Freshman Year University of Wisconsin

B.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	21	42.2	16	25.0	12	18.7	9	14.1
Quartile II	20	31.7	16	25.4	15	23.8	12	19.1
Quartile III	9	14.1	19	29.7	22	34.4	14	21.8
Quartile IV	9	14.1	11	17.2	15	23.4	29	45.3

German—Freshman Year University of Wisconsin

D.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	30	61.2	13	26.5	4	8.2	2	4.1
Quartile II	15	31.9	13	27.7	10	21.3	9	19.1
Quartile III	3	6.6	12	26.1	15	32.6	16	34.7
Quartile IV	0	0.0	9	19.1	16	34.1	22	46.8

Mathematics—Freshman Year University of Wisconsin

F.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	22	40.7	20	37.1	7	13.0	5	9.2
Quartile II	22	40.7	13	24.1	13	24.1	6	11.1
Quartile III	9	16.7	14	25.9	13	24.1	18	33.3
Quartile IV	1	1.8	7	13.0	21	38.9	25	46.3

History—Freshman Year University of Wisconsin

H.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	33	60.0	13	23.6	5	9.1	4	7.3
Quartile II	16	29.1	20	36.4	12	21.8	7	12.7
Quartile III	6	10.9	19	34.5	16	29.1	14	25.5
Quartile IV	1	1.8	2	3.7	21	38.9	30	55.6

A. High School Grades
(in English) of
255 Pupils from
8 High Schools

A. High School Grades (in English) of 255 Pupils from 8 High Schools		32 33 39 48 57 71 148 189 153 155 185 91 79 49 16 56 72 155 83 73 14 29 83 75 37 113 95 41 119 166 132 130 114 121 226 237 248 228 235 263 94	21 52 65 195 193 169 186 190 170 181 179 100 183 232 211 213 214 187 195 205 231 241 245 234 253 252 254 255 260 243 263 244 265 266 324 261 259	55 160 149 164 180 251 150 130 159 68 209 177 182 230 194 231 92 165 220 247 249 241 245 257 246 258 260 255 260 243 263 244 265 266 324 261 259	Q't'le I = 65 " II = 62 " III = 64 " IV = 64	PLA																			
71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96

Q'tile I = 65
" II = 62
" III = 64
" IV = 64

PLATE IV

B. Grades (in English) of Same
255 Pupils in
Freshman Year

TE IV

B. Grades (in English) of Same
255 Pupils in
Freshman Year

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Q'tile I = 64
" II = 63
" III = 64
" IV = 64

C. High School Grades (in German)
of 189 Pupils from
8 High Schools

of 189 Pupils from										68 73										" II = 48																													
8 High Schools										159 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397										" III = 45																													
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Q'tile I = 48
" II = 48
" III = 45
" IV = 48

D. Grades (in German) of Same 189 Pupils
in Freshman Year

D. Grades (in German) of Same 189 Pupils in Freshman Year

Q'tile I = 49

" II = 47

" III = 46

" IV = 47

25 29 61

70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98

Q'tile I = 49
" II = 47
" III = 46
" IV = 47

E. High School Grades
(in Mathematics) of
216 Pupils from
8 High
Schools

E. High School Grades																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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No. in Each Q'tile = 54

G. High School Grades (in History) of 219 Pupils from 8 High Schools,

Q'tile I = 56
" II = 54
" III = 54
" IV = 55

45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

VI. CORRELATION BY SEPARATE STUDIES

(See Plate IV, Charts A-H, Plate V, A-D and Plate VI, A-P.)

The comparisons thus far have been made on the basis of the general averages of the students' marks in all subjects; in this section the standing of a pupil in a single study, such as English, in the high school is compared with his rank in English in the freshman year. The first groups studied are composed of students entering from the eight high schools. As a more ready means of comparison of the extent of correlation of high school and university standings in the various subjects there is given the following table of "percentages of retention"⁽¹⁾ in each quartile for each subject. The school subjects considered are History, German, English, and Mathematics, and they have been arranged in order beginning with the subject,—History—which shows the closest correlation, i. e., has the largest number of pupils maintaining substantially the same relative rank in the university as in high school. The percentages, thus, indicate the percentages of those in each quartile who were in the same quartile in high school. (Cp. Plate and Table IV A-H).

Percentages of Retention by Subjects

	1st q.	2nd q.	3rd q.	4th q.
	%	%	%	%
History	60	36	29	56
German	61	28	33	47
English	42	25	34	45
Mathematics	41	24	24	46

As the table shows, the relative ranks of pupils are disturbed much more in English and Mathematics than in the other two subjects. Considerably less than a half of the students maintain their former standings. The absolute grading of these pupils as a group in History and English is substantially the same, the average is 84 in each case, and the number of pupils assigned to the various grades is not materially different, but the individuals who in the university are considered good, poor or indifferent, are not in a considerable

⁽¹⁾ See footnote on page 29.

V

Table V Color Distributions (by quartiles) of 115 Pupils Entering from Madison High School— According to General Average — See Plate V.

High School			
Quartile I	100 % Red	Quartile III	100 % Green
Quartile II	100 % Purple	Quartile IV	100 % Black

Freshman Year University of Wisconsin

F.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	19	67.8	5	17.9	3	10.7	1	3.6
Quartile II	5	17.2	11	37.9	9	31.1	4	13.8
Quartile III	4	13.8	8	27.6	5	17.2	12	41.4
Quartile IV	0	0.0	5	17.2	12	41.4	12	41.4

Sophomore Year University of Wisconsin

G.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	21	72.4	5	17.26	3	10.34	0	0.0
Quartile II	4	13.8	14	48.26	7	24.14	4	13.8
Quartile III	1	3.6	6	21.4	8	28.6	13	46.4
Quartile IV	2	6.9	4	13.8	11	37.9	12	41.4

Junior Year University of Wisconsin

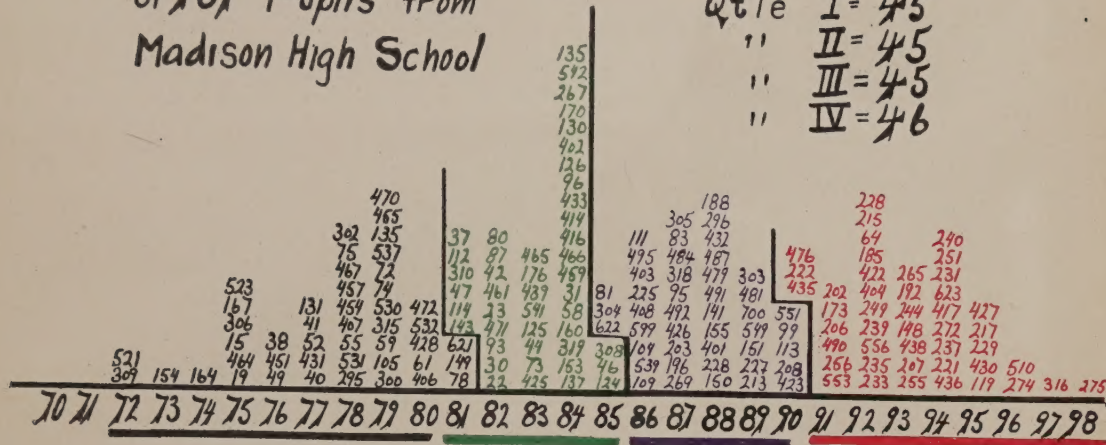
H.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	13	46.4	11	39.3	3	10.7	1	3.6
Quartile II	12	41.4	5	17.2	8	27.6	4	13.8
Quartile III	2	6.9	6	20.7	8	27.6	13	44.8
Quartile IV	1	3.5	7	24.1	9	31.0	12	41.4

Senior Year University of Wisconsin

I.	Red		Purple		Green		Black	
	#	%	#	%	#	%	#	%
Quartile I	19	67.9	5	17.8	3	10.7	1	3.6
Quartile II	4	13.8	10	34.5	8	27.6	7	24.1
Quartile III	4	13.8	10	34.5	8	27.6	7	24.1
Quartile IV	1	3.6	4	13.8	10	34.5	14	48.1

A. High School Grades (in Mathematics) of 181 Pupils from Madison High School

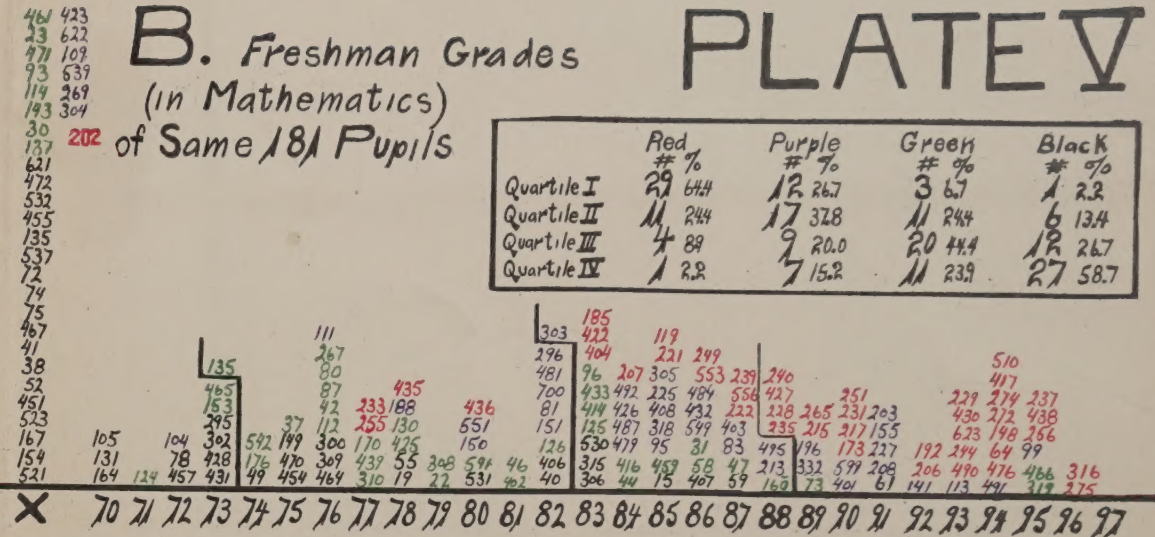
Qt'le I = 45
" II = 45
" III = 45
" IV = 46



B. Freshman Grades (in Mathematics) of Same 181 Pupils

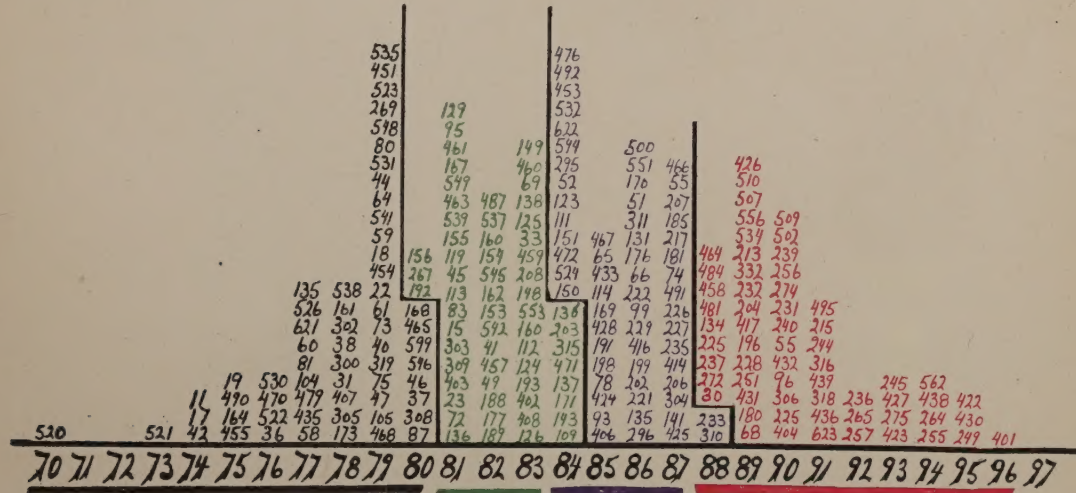
PLATE V

	Red # %	Purple # %	Green # %	Black # %
Quartile I	29 6.4	12 2.7	3 6.7	1 2.2
Quartile II	11 2.4	17 3.8	11 2.4	6 13.4
Quartile III	4 8.8	9 20.0	20 44.4	12 26.7
Quartile IV	1 2.2	7 15.2	11 23.9	27 58.7



C. High School Grades (in English) of 244 Pupils From Madison High School

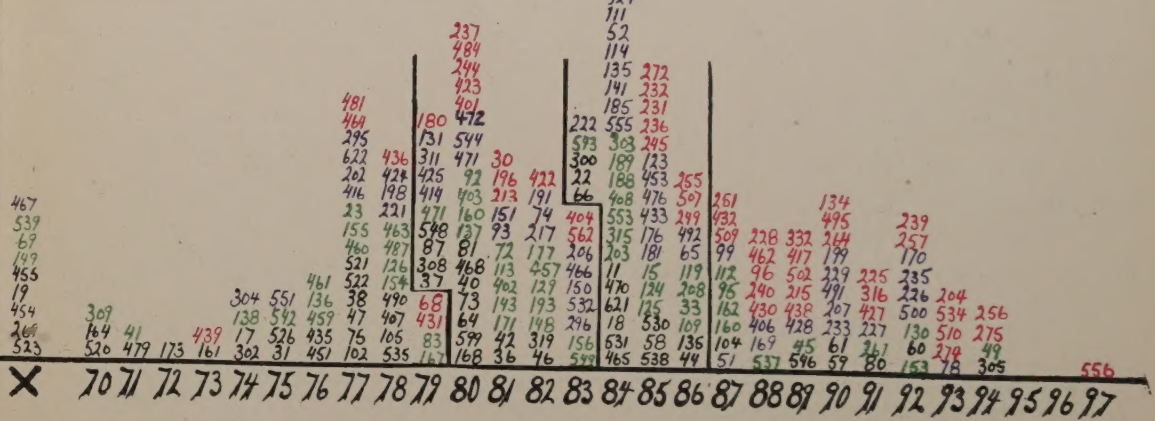
Number in Each Quartile = 61



D. Freshman Grades (in English) of Same 244 Pupils

Number in Each Quartile = 61

	Red # %	Purple # %	Green # %	Black # %
Quartile I	28 45.9	10 26.4	10 16.5	7 11.7
Quartile II	15 24.6	17 27.9	15 24.6	14 22.9
Quartile III	12 19.7	17 27.9	17 27.9	15 24.5
Quartile IV	6 9.8	10 16.4	19 31.2	26 42.6



number of cases the ones who were so considered in the high school. Whereas, the university records in History agree or correspond more nearly with the relative rank of pupils in this subject in high school.

These same facts are further indicated by comparing the percentages of the first and last quartiles remaining in their respective halves of the class. In History, 89 per cent of the "reds" are in the first half of the class and 81 per cent of the "blacks" are in the lower half of the class. The corresponding percentages for the other subjects are: for German, 93 per cent of "reds" and 81 of "blacks"; for English, 74 of "reds" and 67 of "blacks"; for Mathematics, 81 of "reds" and 80 of "blacks." English thus ranks lowest by this method of comparison. With the exception of English, as these latter figures indicate, the change made in the relative standings is not extensive, i. e., a change chiefly from one quartile to the neighboring quartile.

§ 1. The Madison High School

(See Plate V, Charts A-D, and Plate VI, Charts A-F.)

These results have been corroborated by studying the single high schools separately. In the case of the Madison high school, the percentages for the various subjects are about the same as for the groups just considered, with the exception of mathematics. The results may best be compared by referring to the general averages for the school. The percentages of those of each high school quartile, who still remain in the same quartile, are given in the following table:

	1st q.	2nd q.	3rd q.	4th q.	No. of
	%	%	%	%	Cases
General Average	61	30	32	52	(238)
History	63	20	29	38	(97)
German	61	39	26	44	(126)
English	46	28	27	43	(244)
Mathematics	64	39	44	59	(181)
Latin	62	53	15	54	(39)

List of Charts on Plate VI

(See also Tables of Percentages of Retention in Chapter VI of Text.)

	No. of Cases
Chart A. <i>History</i> . Madison High School.....	97
Chart B. <i>History</i> . Same group. Freshmen in University.	
Chart C. <i>German</i> . Madison High School.....	126
Chart D. <i>German</i> . Same group. Freshmen in University.	
Chart E. <i>Latin</i> . Madison High School.....	39
Chart F. <i>Latin</i> . Same group. Freshmen in University.	
Chart G. <i>English</i> . Milwaukee High Schools.....	92
Chart H. <i>English</i> . Same group. Freshmen in University.	
Chart I. <i>Mathematics</i> . Milwaukee High Schools.....	69
Chart J. <i>Mathematics</i> . Same group. Freshmen in Univ.	
Chart K. <i>History</i> . Milwaukee High Schools.....	64
Chart L. <i>History</i> . Same group. Freshmen in University.	
Chart M. <i>English</i> . Smaller High Schools.....	53
Chart N. <i>English</i> . Same group. Freshmen in University.	
Chart O. <i>History</i> . Smaller High Schools.....	42
Chart P. <i>History</i> . Same group. Freshmen in University.	

The remarkably close correlation of the high school and freshman standings of the students in mathematics from the Madison High school suggests an interesting line of comparison which unfortunately it will not be possible to more than indicate in this study. The result is striking since the mathematical group mentioned above, composed of members from eight high schools (including a smaller group from the Madison High school) showed as a group rather poor correlation with University standards. This indicates the variation which may exist in the preparation in the various subjects of study in the different high schools. A group of 69 students from the Milwaukee High school did not maintain anywhere nearly as closely their relative standings in mathematics in the University, as may be seen in the following tables. But 39 per cent

remain in the first quarter as compared with 64 per cent in the case of the larger group studied in the case of the Madison High school. ⁽¹⁾

§ 2. The Milwaukee High Schools

(Cp. Plate VI, Charts G-L.)

A table is given below of the "percentages of retention" in the separate subjects of study of pupils from the Milwaukee high schools. As in the preceding tables in this chapter, the percentages indicate the number of those who remained in the same quartile of the class in which they were in high school. The number of cases is not large but sufficient to indicate the variations that may exist both in the same high school and between different high schools in this respect. The "general average" of the first line of the table indicates the "percentages of retention" of the larger group shown on Plate III and based on the general averages of the ranks in all subjects of the students entering from the Milwaukee high schools during the years under consideration.

	1st q.	2nd q.	3rd q.	4th q.	No. of
	%	%	%	%	Cases
General Average.....	59	37	29	46	139
English	48	30	42	65	92
Mathematics	39	29	29	41	69
History	69	31	38	56	63

§ 3. The Smaller High Schools

(Cp. Plate VI, Charts M-P.)

Although the groups are rather too small to draw trustworthy conclusions from them, the "percentages of retention," as in the case of the preceding schools, are given below in two subjects and in the general average for the four smaller high schools.

⁽¹⁾ It should be mentioned in this connection that with the exception of the groups in English and Mathematics from the Madison High school, the distributions studied in this chapter do not include all the students who entered during the years 1900-1905, as was the case in the preceding distributions. They were made out before it was decided to add two additional entrance classes to the group studied and it has not been possible to redistribute them as was done in the case of the other groups studied. This fact will explain the differences in the sizes of these groups.

	1st q.	2nd q.	3rd q.	4th q.	No. of
	%	%	%	%	Cases
General Average	57	17	22	48	92
English	38	31	25	40	53
History	50	20	27	36	42

A study of the Charts in Plates IV, V, and VI, will disclose several interesting comparisons. In the case of the mathematics group in Plate IV, it will be noticed that the individual numbered 53 ranked 99 in the freshman year. This is the highest rank secured by any student in the whole group considered in this study, and it is interesting on this account to note that in high school he belonged to the lowest quarter of the class. A reference to this individual's card shows that in high school he was similarly in the lowest quarter of his class in all his high school subjects with one exception, (History), whereas in the university he maintained a very much higher rank in *all* subjects than in high school, the general average for three years in the university being 90, as compared to 81 in high school. The improvement in standing was, therefore, general and not confined to the one study.

VII. ELIMINATION FROM THE UNIVERSITY

In order to determine both the percentage of those who left the university in the freshman and sophomore years, in the case of the group under study, and more particularly the relative standings of these pupils in the university, the individuals who dropped out have been indicated in the charts, (See Plate I and III), by placing a square about their numbers. By a reference to these charts and Tables I and III both the number and the academic standing of the pupils who for one reason or another are eliminated from the university, may readily be determined. As was to be expected, the larger number who drop out are found in the lower quartiles. Out of the group of 472, 93, or 19.7 per cent leave during freshman year and 43, or 12 per cent during sophomore year, showing a total of 136, or 31.7 per cent eliminations in the two years. In other words, about one-third of the group were eliminated in the first two years of college.

About 50 per cent of these are from the lowest quarter of the class, 23 per cent and 17 per cent from the third and second quarters, respectively, and less than 10 per cent from the first quarter. Similar percentages hold in the high school quartiles, (readily determined by the percentage of red, purple, etc., colors). Only 15 per cent of those eliminated in freshman year were in the first quarter of their high school classes, whereas 42 per cent of them were in the lowest quarter of the high school class. The eliminations of the sophomore year are much less dependent on high school standing, and correspond more closely with the university standing. (See Table I under eliminations.)

Rank in high school has, therefore, as is to be expected, a definite relation to the question of elimination in the university. It is evident from these results that a student entering the university from these schools with a rank or general average of 85 or above, for example, is much more likely to continue through freshman year than that one whose high school rank was below 85. In this case there were 244 (56.9 per cent) of the group who attained this or a higher rank in high school, but 29, or 12 per cent of them drop out during freshman year, whereas, of the remaining 228, 64 or 27.5 per cent are eliminated.

As may be seen from the Charts on Plate III and from the figures in Table III, under "Elimination," the schools or cities from which the pupils come appear to have some influence in the matter of elimination from the university. The number of cases is rather too small, however, to more than indicate a possible tendency. The largest percentage of elimination is in the case of pupils from Milwaukee, and the smallest from the group of four high schools. The facts are as follows: 40 out of 139, or 29 per cent of those who entered from the Milwaukee high schools did not remain in the university after freshman year; in the case of Madison, the figures are, 49 out of 238, or 20.6 per cent and in the case of the four smaller high schools but 10 out of the 92 who entered, or 11 per cent, were eliminated.

VIII. GENERAL CONCLUSIONS

If we divide the pupils entering the university from the larger high schools of the state, into two equal parts on the basis of their ranks in high school studies, grouping those in the first half who secured the higher marks in high school and in the second half those who ranked lower, about 70 per cent of those in each half will remain in the same half of the group during their freshman as well as during the subsequent years at the university. ⁽¹⁾ The correlation between standings in the high school and in the university is even closer than this rough method of comparison would seem to indicate, because in the case of the above example, a change of a single grade or so near the median or dividing line between the two halves, if made by a number of individuals, would influence the composition of the two groups, materially. And it is likely that this frequently occurs because the majority of pupils in these distributions are centered about the median.

Another method may also for this reason be employed: namely, that of considering what percentage of those who were in the highest and in the lowest quarter of the group in high school remain in the upper and lower halves, respectively, of the class in the university. ⁽²⁾ According to this method of comparison, a little over 80 per cent of those who were in the lowest or highest quarter of the group in high school are found in their respective halves of the group throughout the university. With the results of these two methods of comparison in

⁽¹⁾ The actual percentages of those remaining in the same half of the class in which they enter, are as follows: In the group of 472, 65 per cent, freshman year; 76 per cent, sophomore year. In the group of 180, 70 per cent remain in their respective halves of the class through the four years at the university. In the group of 115 from high school A, the percentages for the four years are, 70 per cent, 77 per cent, 72 per cent, 66 per cent.

⁽²⁾ The actual percentages of those who were in the first and last quartiles on the basis of their high school rank who remain in their respective halves of the group in the university are given below for some typical distributions:

82 per cent (reds), 86 per cent (blacks), Freshman year, group of 180.

82 per cent (reds), 84 per cent (blacks), Sophomore year, group of 180.

80 per cent (reds), 84 per cent (blacks), Junior year, group of 180.

82 per cent (reds), 78 per cent (blacks), Senior year, group of 180.

81 per cent (reds), 74 per cent (blacks), Freshman year, group of 472.

93 per cent (reds), 76 per cent (blacks), Sophomore year, group of 472.

mind, we are safe in concluding that three-fourths of the students who enter the university from these high schools will maintain throughout the university approximately the same rank which they held in high school.

The correlations between high school and university rank in the various school subjects is closer for some than for others. In the four subjects studied in some detail, the relative ranks maintained by students in History and German were more nearly the same than in the case of English and Mathematics. That is, those students who stood well or poorly, for example, in the high school History classes, maintained more closely the same relative rank in the History courses in the university than they did in the corresponding courses in high school and university English.

There is no evidence that the student who stands lowest in his class and barely gets accredited to the university is at all likely to lead his class in the university. Thorndike found in the case of the entrance examinations at Columbia that had the marking been the least bit more strict, the best student in three college classes would have been excluded. In the case of the group of nearly 500 pupils studied in this investigation, there was but one who was in the lowest quarter of the group in high school who attained the highest rank given in the university. The others who rose in rank to the first quarter of the group were excelled in rank by a dozen or more of those who had previously outranked them in high school.

In view of these facts, there is no reason to believe that the standards prevailing in the university, differ materially, if at all, from those maintained in the best high schools of the state. One would naturally expect some rearrangement of standing in the university. Some pupils who have applied themselves to their studies in the high school will for one reason or another, neglect their work at the university; upon others, the change to the university will prove stimulating, new interests will develop, and so on. The factors making for changes in the high school relations are apparent to all. Practically all the changes found between the relative standings of pupils in the high school and university may very well be attributed to these perfectly natural causes. One might very possibly have expected even a greater change on account of these reasons

alone than has actually been found. It is at least quite safe to conclude that such changes as have been found are due to such known causes, and that they are not due to any arbitrary differences between university and high school standards.

For these reasons the general averages of the grades attained by students in high school furnish a satisfactory method for estimating the students' probable efficiency in university work. This is very evidently true of the larger high schools of the state. In how far this would hold true of the smaller high schools of the state, can only be determined by further investigation.

These facts effectively dispose of the notion that students in any great numbers do differently in scholarship in the university from what they do in the high school. There is little or no foundation in the facts thus adduced for the belief, cherished most frequently perhaps by the less successful and indifferent students of the high school, that the bright pupils often "fag out" or find that the university courses demand more sterling, or, at least, different, abilities from those demanded by the high school, and that others then find opportunity to show what is in them, and soon surpass their more precocious but less enduring classmates. All this may occur in individual cases, but quite the opposite is the rule. Those who get the best start in the high school maintain their advantage in the university; their classmates seldom overtake them.

Section 1. The superiority of the accredited school system in comparison with the entrance examination.

It is apparent from the results of this investigation that at least in the case of the larger high schools in the state of Wisconsin the method of accredited schools as a basis for admission to the state university furnishes a successful means for the selection of students. The results are in sharp contrast to those secured by the test of the entrance examination at Columbia College. As far as the writer is aware, the latter study is the first careful investigation which has been made of the results of the entrance examination, and in the absence of further evidence, may, with doubtless some modifications, be taken as fairly representative of the general workings of the entrance examination. The primary qualifications for admission to college should be the ability to profit by the instruction which the

college has to offer. This investigation indicates very clearly that the previous rank of pupils in the accredited school furnishes a satisfactory means for forecasting the likelihood of successful work at the university.

